Report on some collections of middle stone age artefacts from Riverton, Kimberley district, South Africa

by

A. J. B. HUMPHREYS

Alexander McGregor Memorial Museum, Kimberley

INTRODUCTION

A series of assemblages consisting mainly of "Middle Stone Age" type artefacts was collected by Prof. K. W. Butzer and Dr. G. J. Fock during their study of the "Riverton Formation" near Riverton-on-Vaal (28° 33′S, 20° 46′E) in the Kimberley area (Butzer, Helgren, Fock and Stukenrath, 1973). (Fig. 1). The assemblages consist of groups of artefacts collected from confined areas that had been exposed by recent erosion; some are clearly in secondary context while others are considered to have probably been in semi-primary context before exposure (Butzer *et al.*, 1973). The assemblages were derived from Member III of the Riverton Formation which relates to the late Upper Pleistocene; Member III is considered, on the basis of radio-carbon dating, to have terminated no later than 17 000 BP.

Four collections of artefacts were given to the writer for analysis in February 1973, by Mr. David M. Helgren. The stratigraphic positions of the collections relative to the Riverton Formation are shown in Fig. 2 and 3.

METHOD OF ANALYSIS

As already mentioned, the majority of the artefacts can be related on typological grounds to the "Middle Stone Age." The dating of Member III of the Riverton Formation confirms this impression (Butzer *et al.*, 1973).

Perhaps the most clearly defined typology devised for the analysis of "Middle Stone Age" artefacts is that employed by Garth Sampson in the Middle Orange River area (Sampson 1968). The Middle Orange River is only some 240 km SSE of Riverton and so it was decided to use this scheme in the analysis of the Riverton collections. Full details of the types are to be found in Sampson's monograph on "The Middle Stone Age Industries of the Orange River Scheme Area" (Sampson 1968: 11–13).

PHYSICAL STATE OF THE COLLECTIONS

A wide range of weathering variation is apparent in each collection: some artefacts are very heavily patinated or weathered while others are completely fresh. From the point of view of *etat physique*, therefore, the collections would not appear to be homogeneous in terms of internal age variation.

However, all of the unpatinated artefacts are made on cherty raw materials (chert, jasper, agate, etc.) that do not normally produce patinas ("desert varnish") at the same rate, nor of the same type, as do andesite and lydianite (on which most of the other artefacts are made),

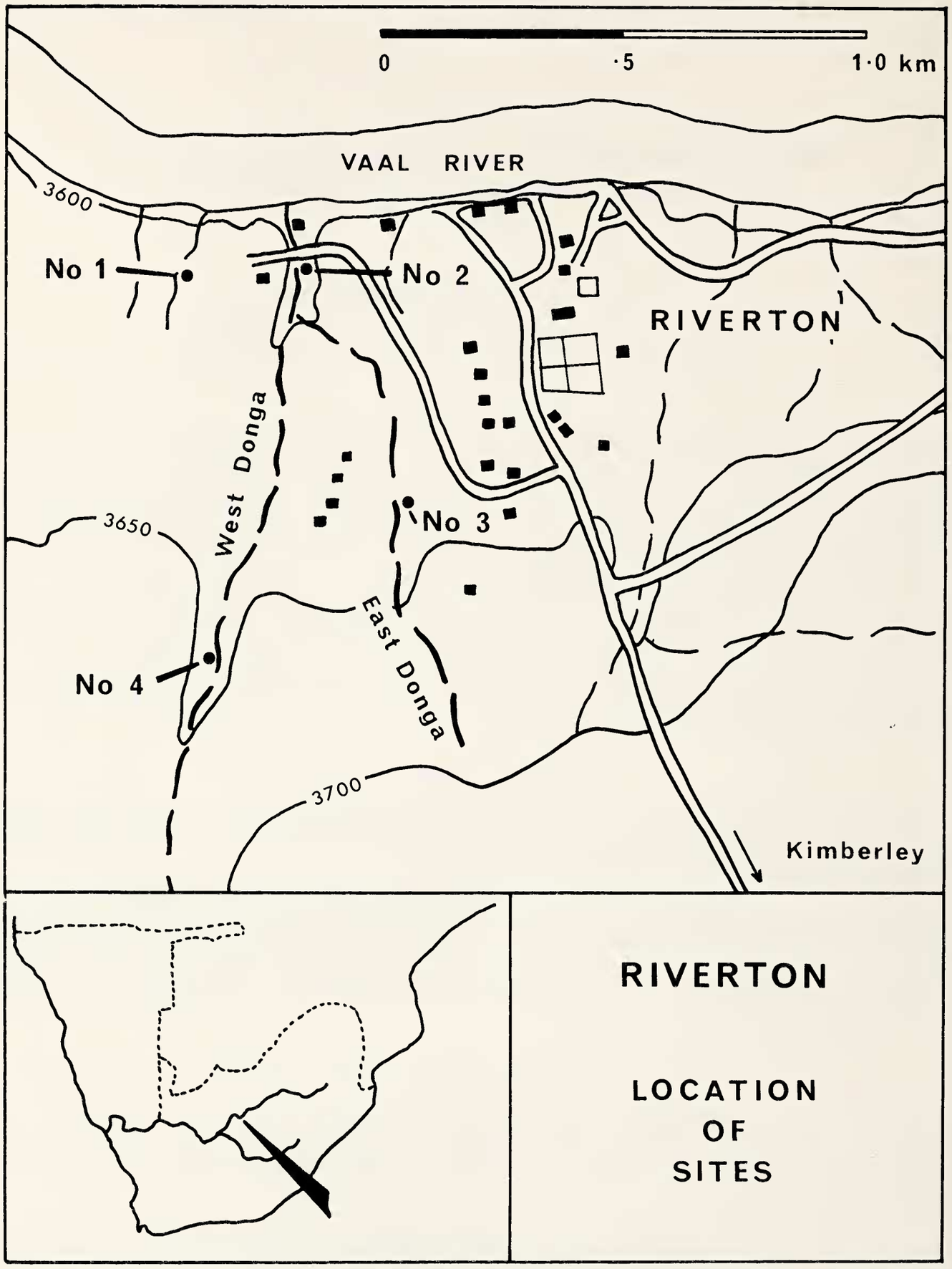

Fig. 1. Map showing the location of Riverton-on-Vaal and the sites of the various Collections.

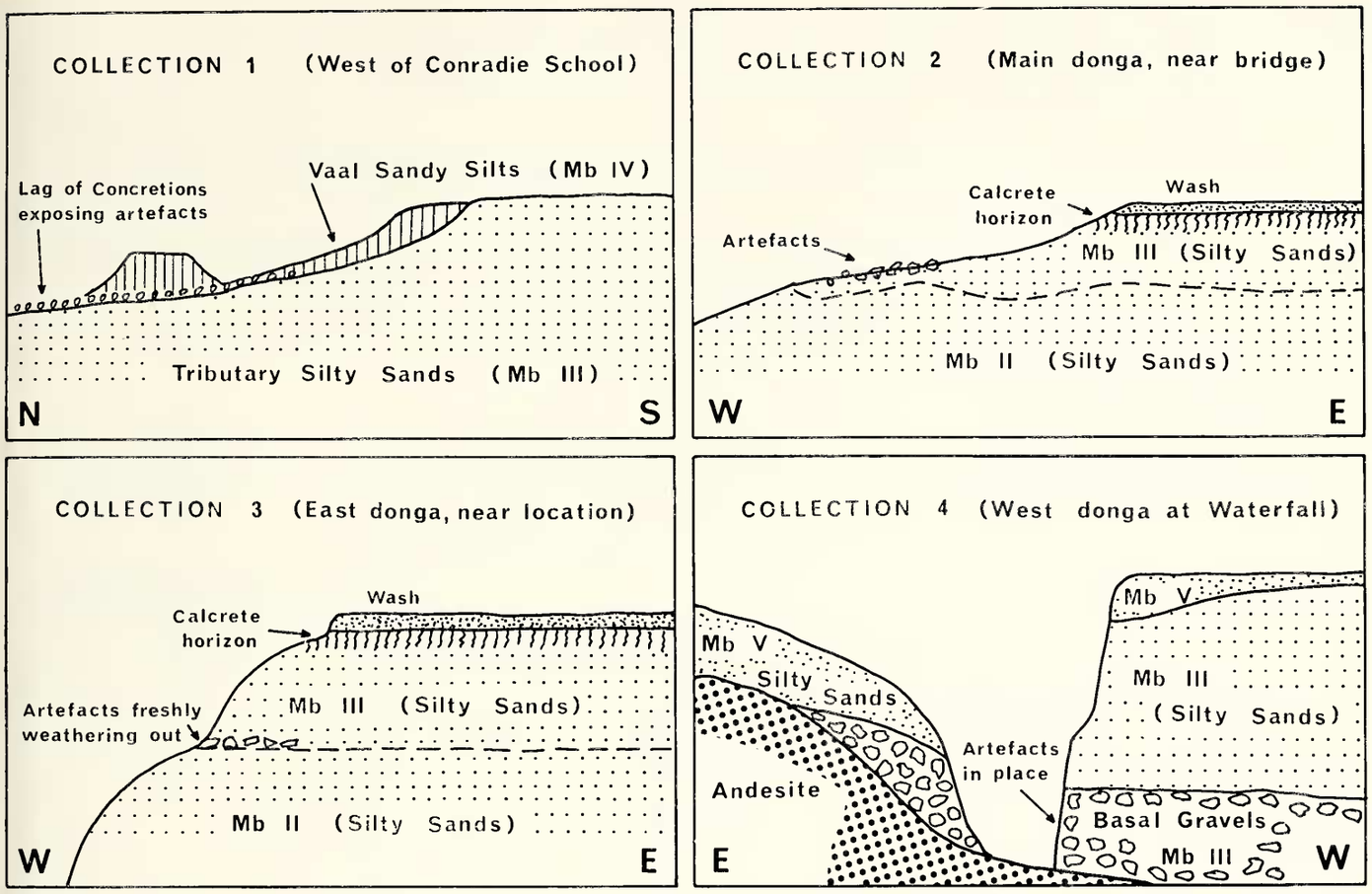

Fig. 2. Schematic location of four artefact Collections near Riverton-on-Vaal. Not to scale. Data based on K. W. Butzer (pers. comm.).

which quickly produce a ferromanganese patina, or quartzite which forms a siliceous sheen relatively rapidly. Little is known about the mechanisms of patination except that the process can be quite rapid in a subarid to semiarid environment, proceeding in as little as a few decades (see Engel and Sharp, 1958). Thus much of the patination apparent in Collection No. 1 below presumably reflects on the duration of exposure of individual artefacts that have been exhumed by sheet wash or gullying during the present century.

A second aspect of variation concerns the white, greenish, or reddish weathering rinds apparent in each of the collections. The white to greenish tones are restricted to artefacts coming from white, calcareous sands (Collection No. 2–4) and reflect on surficial alteration in an alkaline environment, e.g. of the olivine of the andesites. In general, Collection No. 2 has thin rinds or cortices of this type, compared with Collection No. 3, suggesting the possibility that No. 3 was already weathered prior to being deposited in Member III of the Riverton Formation or, alternatively, that it is substantially older within the time range reflected by Member III. Furthermore, Collection No. 2 shows a variable degree of patination superimposed on such a whitish cortex, presumably reflecting on its attenuated exposure whereas Collection No. 3 was still largely in place within the sediment body. By contrast, Collection No. 1 shows a variable degree of development of reddish weathering rinds, all overlaid by recent patinas. These particular differences can be attributed to the contact of a noncalcareous silt (Member IV), resting over a lag horizon of calcareous sands (Member III), that are marked by a variety of reddish yellow oxidation bands and mottles. Those artefacts completely embedded within the lag and subjacent calcareous sands developed noticeable reddish cortices

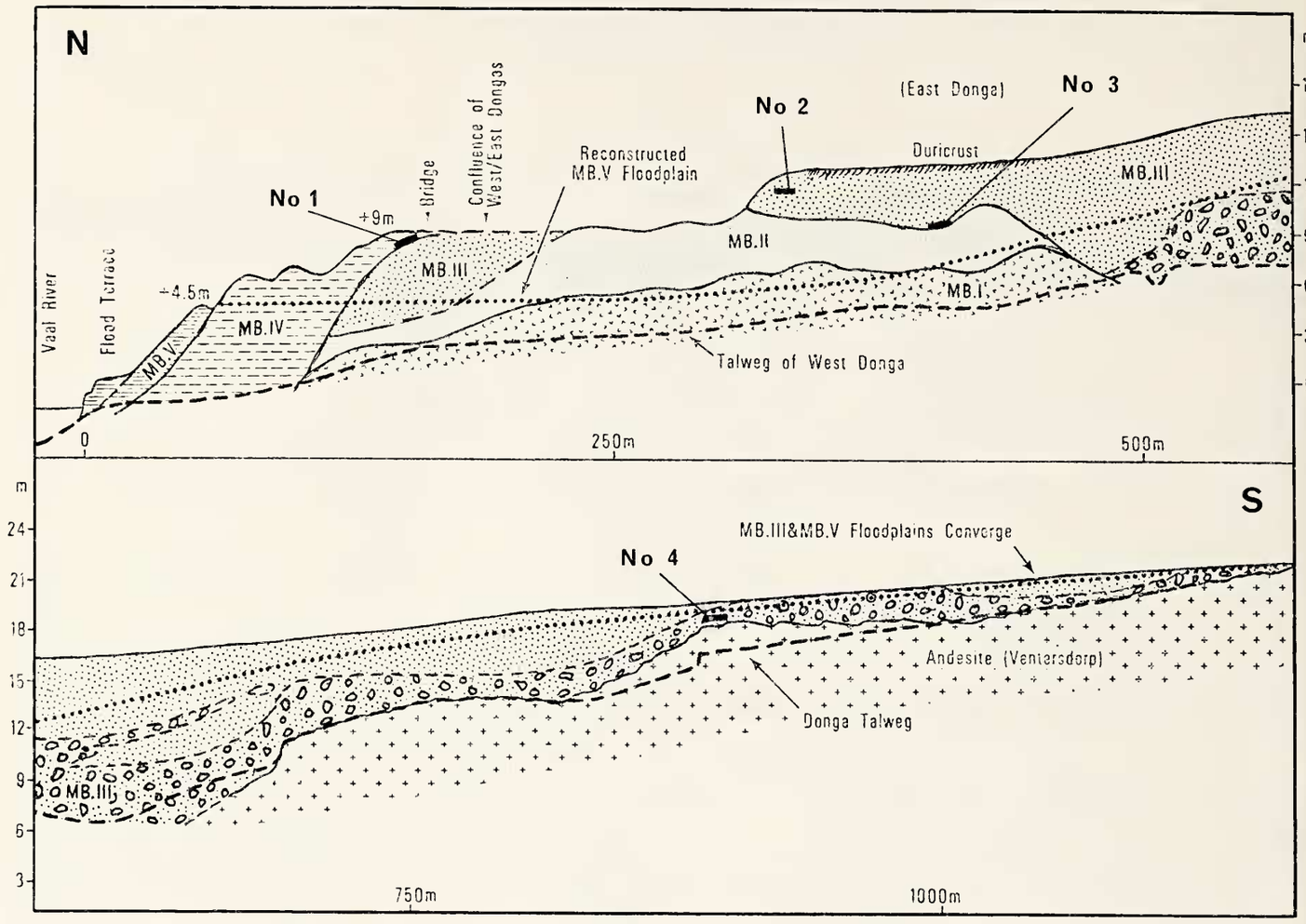

Fig. 3. The relative stratigraphic positions of the Collections within the Riverton Formation. Figure adapted from Butzer *et al.* (1973).

prior to exposure, whereas artefacts surrounded by the silts were essentially fresh in appearance until later patinated on the surface. Thus a group of artefacts all originally found in a 3 cm stratum along this lithological contact would develop quite a range of variability in terms of *etat physique*.

Consequently, *etat physique* offers no reliable grounds for chronological differentiation of artefacts within the collections. So, for example, the collections include a variable number of unretouched flakes, mainly small, that lack cortices or patina, but which at the same time comprise essentially the sum total of the siliceous/cherty raw materials. These flakes are typologically undiagnostic, and could fit in either a "Middle" or "Later Stone Age" context. Whereas the possibility of some younger, intrusive artefacts among the surface scatters of Collections No. 1 and 2 cannot be entirely excluded, all the materials of Collections No. 3 and 4 were buried by sediment at the same time. It appears reasonable, therefore, to include these seemingly "fresh" artefacts within the respective assemblages among which they were found.

THE STRATIGRAPHY OF THE RIVERTON FORMATION

Full details on the stratigraphy of the Riverton Formation are presented in Butzer *et al.* (1973) but a brief outline of the sedimentary units is necessary here to provide a geological background to the assemblages to be described.

The Riverton Formation consists of a complex stratigraphic sequence of deposits which span all of the late Pleistocene and Holocene and which postdate the Younger Gravels of the Vaal Sequence. Five stratigraphic units (or "Members") have been recognised and may be summarised as follows:

Member I: Over 6 m, base not exposed; light coloured, generally massive clayey silt, interdigitated with lenses of sandy or gravelly detritus. A Vaal floodplain deposit, 8,5 m above modern flood water.

Member II: 7 m White silty sands to sandy silts with despersed basal pebbles, followed by 60 cm light gray loam vertisol. A Vaal flood silt to + 10,5 m.

Member III: 9 m Local alluvia grading into + 13 m Vaal terrace. Includes basal gravels up to more than 3 m thick, followed by white calcareous silty sands with gravelly lenses.

Member IV: 9 m. Vaal terrace at + 8,5 m, embanked against Member III, and consisting of brownish clayey to sandy silts.

Member V: 6 m. Tributary alluvia interdigited with +4,5 m Vaal alluvial terrace.

Member III is the only unit to have yielded archaeological material and the Collections to be described here are representative of this material.

Radiocarbon dating based on *Achatina* shells suggests that "alluviation of Member III terminated no later than 17 000 B.P." (Butzer *et al.*, 1973). There are no absolute dates for the other Members.

DESCRIPTIONS OF THE COLLECTIONS

No. 1 Donga West of Elizabeth Conradie School

These artefacts were collected from three semi-contiguous concentrations within an area some 10 m in diameter. The nature of these three surface concentrations suggests the possibility of a semi-primary association.

The types present are as follows:

Trimmed/Utilised Blades	14	10,0%
T/U Blade Fragments	12	8,6%
T/U Flakes	22	15,8%
Frontal Scrapers	2	1,4%
Convex Scrapers	8	5,7%
Burins	—	
Trimmed Points	4	2,8%
Untrimmed Blades	13	9,3%
Untrimmed Blade Frags	7	5,0%
Untrimmed Flakes	55	39,5%
Cores	2	1,4%
	139	

The artefacts all conform well to the types defined by Sampson and perhaps the only ones worthy of special comment are the four unifacial "Trimmed Points". The first is a neatly made "lanceolate" shaped point. There is minimal retouch and the shape was achieved by the form of the original flake. The dorsal surface consists largely of cortex and the form of the flake may consequently have been achieved more by accident than by design. The point is 74 mm long, 29 mm wide and 10 mm thick. The second point was made on a triangular levallois point

and again retouch is minimal. The dimensions are 63 × 37 × 12 mm. The third specimen was also made on a triangular levallois point; in this case the retouch along the edges has created a serrated or "oak-leaf" effect. The dimensions are 69 × 44 × 15 mm. The fourth point is extensively retouched, but cortex has been preserved on the butt half of one edge. The point measures 77 × 36 × 13 mm.

The "Convex Scrapers" include one very large specimen; it is 132 × 132 mm and some 67 mm thick. It may be associated with the "Middle Stone Age" artefacts, but the fact that it was found in isolation at the periphery of the collecting area and is very much fresher than the other artefacts suggests the possibility of derivation from another (later?) context. The large Convex Scraper is made from andesite.

The lengths of the whole "Trimmed/Utilised Blades" may be summarised as follows:

Max: 78,0 mm
Min: 30,0 mm
Mean: 48,6 mm

These measurements have been recorded so that they can be compared with data presented by Sampson, as will be seen later.

The raw materials represented are as follows:

Lydianite	*Quartzite*	*Andesite*	*Chert, etc.*
93	29	5	12

The nature of the exposed artefact scatters and the shallow over-burden suggest that this occurrence may be worth further archaeological investigation under controlled conditions.

No. 2 Main Donga, East Bank near Bridge

This assemblage was collected from an area 3 × 8 m, on a recently eroded spur of Member III sediment.

The types present are as follows:

T/U Blades	14
T/U Blade Frags.	6
T/U Flakes	24
Frontal Scrapers	—
Convex Scrapers	10
Burins	—
Trimmed Points	1
Untrimmed Blades	—
Untrimmed Blade Frags	3
Untrimmed Flakes	16
Cores	2
	76

The artefacts are again "typical" of the period. The single "Trimmed Point" was made on a triangular Levallois flake; the minimal retouch has produced a serrated or "oak-leaf" effect. The dimensions are 60 × 36 × 13 mm.

The size range of the whole "Trimmed/Utilised Blades" is as follows:

Max: 57,0 mm
Min: 29,0 mm
Mean: 40,5 mm

The raw materials represented are:

Lydianite	*Quartzite*	*Andesite*	*Chert, etc.*
48	6	5	17

No. 3. Eastern Tributary Donga, near Location

These artefacts were collected from an area of 1 square m, reflecting a high concentration at the base of Member III, and what in terms of disposition is probably a former scatter of artefacts reworked by colluvial action.

The types present are as follows:

T/U Blades	12
T/U Blade Frags.	2
T/U Flakes	1
Frontal Scrapers	—
Convex Scrapers	1
Burins	—
Trimmed Points	—
Untrimmed Blades	2
Untrimmed Blade Frags.	1
Untrimmed Flakes	23
Cores	6
	48

In addition: 2 "Early Stone Age" artefacts:
(1 cleaver; 1 trimmed fragment).

The "Middle Stone Age" assemblage is small and not particularly noteworthy.

The size range for the whole "Trimmed/Utilised Blades" is as follows:

Max: 83,0 mm
Min: 32,0 mm
Mean: 55,3 mm

The raw materials are:

Lydianite	*Quartzite*	*Andesite*
11	5	32

The "Early Stone Age" cleaver is made from andesite; it is $149 \times 108 \times 37$ mm, and was made on a "side-struck flake." The andesite cleaver is both more weathered and waterworn than the andesite artefacts assigned to the "Middle Stone Age." This suggests that, although the "Middle Stone Age" artefacts are themselves rather undiagnostic, they may be correctly assigned. On the other hand, it is interesting to note how, as a result, the raw material is dominated by andesite in contrast to the other assemblages where lydianite was the preferred raw material. From this point of view the possibility also exists that this is a mixed assemblage (for it was not in primary context) but with no typological grounds for separating some of the less "characteristic" artefacts.

The artefacts were strongly concentrated at one level and were picked out *in situ* from the base of Member III. They could possibly have originally been eroded from Member II deposits or be substantially older than the other "Middle Stone Age" assemblages within the time range reflected by Member III, as was suggested above.

No. 4. *Riverton West Donga, Basal Gravel, Member III at "Waterfall"*

This assemblage was taken from the intact gravel body immediately above the andesite boss 900 mm upstream in the west donga. The artefacts were found distributed through a considerable thickness of sediment and lacked any horizontal association or vertical concentration; they clearly came from a secondary context.

The following types are present:

T/U Blades	1
T/U Blade Frags.	—
T/U Flakes	3
Frontal Scrapers	—
Convex Scrapers	1
Burins	—
Trimmed points	—
Untrimmed Blades	1
Untrimmed Blade Frags.	1
Untrimmed Flakes	5
Cores	1
	13

This assemblage is so small that no meaningful comments can be made on it.

The raw materials present are:

Lydianite	*Quartzite*	*Andesite*	*Chert, etc.*
4	3	2	4

DISCUSSION

Of the four assemblages, only Collection No. 1 from the Donga West of Elizabeth Conradie School is large enough for percentages of tool types to be calculated and even in this one over a third of the artefacts are untrimmed flakes. It would therefore seem that none of the assemblages is of any real diagnostic value—apart from establishing the fact they are all "Middle Stone Age."

Apart from the limited sizes of the assemblages, it is also impossible to relate them to Sampson's sequence because many of his important diagnostic types are not represented. Sampson (1968:101) makes extensive use of variations in core types in the determination of his "Phases" but because the few cores recovered in the Riverton assemblages are undiagnostic, this method cannot be used here.

Perhaps the most remarkable feature in the assemblages is the relative shortness of the "Trimmed/Utilised Blades." The mean lengths for the Riverton assemblages are well below those recorded for the Middle Orange River area where the lowest was 64,0 mm and the highest 145,0 mm (Sampson 1968:105). Here again it is impossible to be sure whether the Riverton area "Middle Stone Age" produced shorter blades as a result of cultural or raw material differences or whether this impression is merely a function of small, statistically insignificant samples.

If, however, there is some truth in the impression that the blades from these assemblages are "short" rather than "long" then it is possible that the assemblages as a group may relate to the later "Middle Stone Age" for both Sampson (1968:99) and Mason (1962:263) suggest that there was a gradual reduction in blade length through time during the "Middle Stone Age."

If this is in fact the case, the assemblages may have been produced nearer the 17 000 year limit for Member III than at the 35–40 thousand dates obtained for some other "Middle Stone Age" sites. The evidence available at present is, however, too scant for any real statements to be made one way or the other.

In conclusion, therefore, it can be said that the assemblages from Member III of the Riverton Formation can comfortably be accommodated within the group called the "Middle Stone Age" and that their presence in these deposits is entirely compatible with a date "greater than 17 000" for the formation of Member III.

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